approach

AUGUST 1972 THE NAVAL AVIATION SAFETY REVIEW

A Friday Night Lineup

Knowledge gained through
past experience *must be app*
if "avoidable" accidents are
be eliminated.

Aug 72

IN 1962, an F-4 *Phantom* was lost when the pilot experienced a hard-over rudder and loss of control. After this accident, a procedure was developed which enabled pilots in many cases to overcome the hazards of a hard-over rudder. It provided the pilots with a method of inducing a utility hydraulic system failure in flight. This permitted the rudder to aerodynamically fair, giving the pilot sufficient control to make a safe landing.

In 1971, another F-4 was lost when the pilot experienced a hard-over rudder which so degraded control that a safe landing could not be made. *The pilot was not aware of the procedure developed as a result of the 1962 accident.* Had he been, the aircraft might have been saved.

The pilot's ignorance of the procedure is regrettable but understandable. The procedure had never been incorporated in NATOPS or any Navywide publication. Rather, it had existed only as an *unwritten* emergency procedure, surviving by word of mouth in the F-4 community, possibly as squadron SOP. Action is now pending on a proposed change to incorporate this procedure in the F-4 NATOPS.

If the loss of the second *Phantom* appears to be a case of failing to profit from experience . . . that's precisely the point. But just in case the point isn't clear, consider the cause of the hard-over rudder in the first place, i.e., the omission of a cotter key.

Shortly before the accident a mechanic installed a rudder control component and failed to cotter key a nut. This was overlooked by the quality assurance inspector. The nut worked loose and the rudder control linkage became disconnected.

Steps have been and are being taken to preserve and disseminate knowledge gained through accident investigation and analysis. This is especially true when accidents occur under unusual or obscure circumstances. A companion effort must be made to update NATOPS, MIMs, SOP, training syllabi, textbooks, etc., to reflect the latest information on accident causes and prevention.

But most important, existing knowledge gained through past experience *must be applied* if "avoidable" accidents are to be reduced or eliminated. In the example (of the F-4) just used, a cotter key was omitted. It's common knowledge that cotter keys and other safety/locking devices used on airframe and engine controls are *critical safety items. No one should be more aware of this than a QA inspector. Yet, this knowledge was not properly applied.*

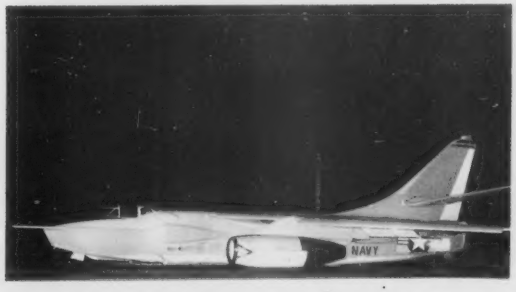
It is the *application of existing knowledge* with which we are most concerned here. NAVSAFECEN records show that many accidents occur time and again, year after year, for causes which are well-known and well-understood.

An important item was missed on the preflight checklist.

1

Here's a Friday night lineup of the old repeat offenders:

- *Checklists.* Failure to use prescribed checklists. Ninety-nine and forty-four one-hundredths percent of all naval aviators are guilty – at least once. Often the result is merely expensive and embarrassing – as an unintentional wheels-up landing. But it should be emphasized that failure to use checklists has resulted in too many fatal/strike accidents.
- *Fatigue.* It's hard to assess the effects of fatigue as a causal factor, but these effects are known to be significant. There are times when pilots are



Fatigue was a factor.

Poor flight planning: Hot weather, high altitude, high gross weight and pilot failed to compute takeoff data.

overscheduled by supervisors, but in many cases it's the pilots who push themselves to the point of near exhaustion. Far from requesting replacement, they *often request to be scheduled.* It is incumbent upon pilots to keep the flight surgeon and/or supervisors informed when they are over-tired or otherwise not up to par physically. No one is more aware of his physical state than the individual himself.

• *Flight Planning.* Poor flight planning has been implicated in a number of accidents, notably those involving fuel exhaustion. However, fuel is not the only consideration in flight planning. Care must be taken to consider *all* facets of each flight which affect aircraft performance, whether it be a cross-country or a local training flight.

• *Tempo of Operations.* There is a recognized need to perform expeditiously many evolutions in naval aviation. However, there is no excuse for omitting important safety checks or flying aircraft which are not safe for flight. There have been several cases where pilots, obsessed with the can-do spirit, knowingly launched with serious aircraft discrepancies. One of these recently resulted in multiple fatalities.

• *Safe Terrain Clearance.* Some of the most tragic accidents involve failure to maintain safe terrain clearance. In two cases of late, the cause involved poor communication or poor navigation. In many cases, the pilots *place excessive reliance on outside agencies to ensure safe terrain clearance.* Further, pilots have overestimated aircraft performance and found themselves in an area of rapidly rising terrain, unable to climb, with no room to maneuver.

The amateur showoffs are disappearing.

• *Unauthorized Maneuvers.* There is considerable evidence that the "flathatter" is slowly disappearing from the scene, but he's not extinct yet. More the pity because several aircraft, not to mention irreplaceable lives, are still lost each year because of unauthorized

Safe terrain clearance: an important matter on every flight.

maneuvers.

• *Weather.* Weather is usually considered an environmental factor rather than a causal factor in aircraft accidents. Nevertheless, pilots still have accidents because of inadequate weather planning or poor foul weather flight procedures – penetrating thunderstorms,

Penetrating thunderstorms not recommended.

Tempo of ops . . . Last minute maintenance plus inadequate Quality Assurance adds up to big trouble.

Get-home-itis was a factor.

making approaches below minimums, etc.

- *Get-home-itis.* Get-home-itis manifests itself as an insane desire to continue as originally planned, regardless of events which unfold during the course of flight. Pilots have stretched range to the point of fuel exhaustion, penetrated severe thunderstorms, flown repeated approaches with weather below minimums, and taken off with serious aircraft discrepancies. Viewed objectively, the pilots seldom have any *real* reason to get home.

- *Pilot's Prerogative.* From time to time, pilots run into situations which demand direct, forceful action. This may mean declaring an emergency, deviating from a clearance, or requesting such assistance as positioning of crash crews. Unfortunately, too many pilots are reluctant to exercise a pilot's prerogative to declare an emergency or to deviate from planned flight to ensure aircraft safety.

This is a brief look at a few of the causal factors which seem to be regular accident producers. These are nowhere near all, of course, but enough to provide food for thought. If accidents attributed to these well-known causal factors can be eliminated, naval aviation safety will be substantially improved.

Pilot had several indications of engine failure. He failed to declar emergency and persisted in flying normal approach. Engine faile 3 minutes later. Aircraft lost.

Knowledge of what causes accidents isn't enough. If we are to profit from experience, we must apply it to the problems at hand. ◄

Those who cannot remember the past are condemned to repeat it.

George Santayana

The May 1972 APPROACH contained an article entitled "Are You Legal?" This article presented a simplified method for computing the crosswind component for landing.

One of our readers, CDR R. M. Tvede, NAS Memphis, wrote that this article would have been a good place to reiterate the fact that *forecast* winds are given in true and not magnetic degrees. We agree and are reprinting a portion of the article "True or Magnetic" which appeared in the June 1970 APPROACH.

True or Magnetic?

TWO A-4C pilots filed an IFR formation flight plan to a destination airfield with forecast surface winds of 350 degrees at 18 knots, gusting to 25. They computed that their crosswind component would be 12 knots with gusts to 16 (landing was planned for runway 03). Their preflight preparations included an extensive review and briefing of crosswind landing techniques, particularly stressing retraction of flaps immediately after touchdown. However, *neither pilot was aware that the forecast surface winds were given in true degrees rather than magnetic whereas the runway heading is always in magnetic degrees.*

Therefore, they did not subtract the required 15 degrees variation to obtain the actual magnetic direction of the wind at destination. This lack of knowledge resulted in their determination that landing conditions would be within the A-4C crosswind limitation. In actuality the conditions were well in excess (16 knots gusting to 22 knots) of the 15-knot NATOPS crosswind component limitation. Had the pilots known how forecast winds are given (true) it was felt that they would not have elected to make the flight, either canceling out or selecting another destination with better winds for landing. It is of interest to note at this point a quote taken from the investigation and analysis section of the AAR:

". . . In defense of both pilots it should be reported that each of the aviator members of the Accident Board also believed that surface winds are reported in magnetic direction. In addition, the Board randomly sampled a large number of other naval aviators and found that very few of those sampled concerning this fact were aware that winds reported by weather offices are in true direction . . . "

However, the fact remains that the flight was made. The wingman, after landing, found the crosswind too much. He ran off the runway and ejected when the aircraft entered rough terrain. He suffered only minor injuries but the aircraft was destroyed.

Discussion

This article, when first published, generated considerable interest, as evidenced by letters received. Mostly, there was confusion as to which wind information is given in true direction and which wind information is given in magnetic direction. Basically, it boils down to this: Weather offices give winds in true degrees. This includes forecasts, sequence reports, etc. Towers and radar final controllers obtain surface winds from indicators calibrated in magnetic degrees.

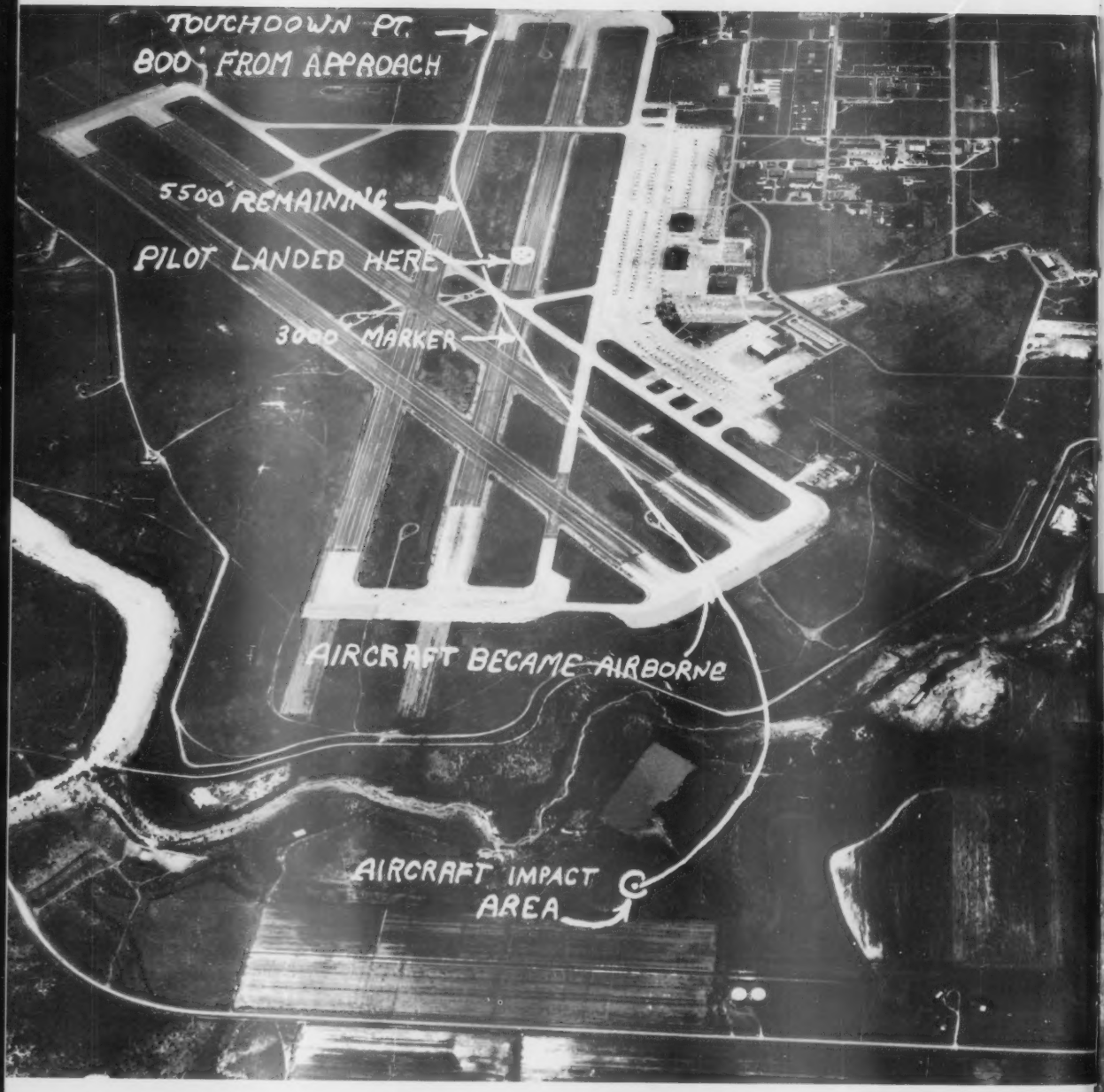
If you are approaching a field for landing and receive wind from the tower, it is in magnetic degrees. The runway heading is in magnetic degrees so there's no problem. However, if the wind is received from a weather facility, it is in true degrees and variation must be applied to properly compare it to runway direction. Admittedly, this is one of the finer points in aviating and may not be worthwhile when there is little variation. That is, it's hardly worthwhile to calculate the effect of five degrees of variation when actual runway heading may be off as much as five degrees from the number indicated (runways are numbered according to the nearest 10 degrees of heading). On the other hand, it may be very worthwhile to apply variation in locales where there are 15 to 20 degrees of variation.

Where can you find variation for a given locale? You can find it on FLIP charts (low and high altitude) and ONC charts.

Applying Variation

There are many rules and gouges for applying variation, but the easiest way we know is: When converting from true to compass, subtract east variation and add west variation. Remember: TVMDC-E+W (true virgins make dull company, subtract east add west) or conversely from compass to true CDMVT+E-W (can dead men vote twice, add east subtract west). ◄

The Brakes of Naval Air



A FLIGHT of three TA-4Js reported the break for landing. The tower cleared the flight to break, and as each aircraft reached the 180, cleared it for landing on runway 35R.

The No. 2 man passed close abeam the 180 at 900 feet. He experienced some trouble during the approach (high most of the way) but was pointed straight down the runway on final.

He touched down slightly right 600-800 feet from the approach end. He added power momentarily, but realizing he was "full stop," reduced it to IDLE.

After 600 feet of rollout, the pilot felt the port wing drop. The *Skyhawk* swerved left. He attempted to correct this with full right aileron and rudder.

The RDO (runway duty officer) later stated the landing appeared normal in all respects. After the aircraft touched down he diverted his attention to the next aircraft in the pattern, then on final. Upon hearing a loud "pop", he turned, and observed that the A-4 on the runway had blown a port tire. He then broadcast, "Wave it off – blown tire on the runway."

Misinterpreting the RDO's transmission, the student on deck added full power to regain flying speed. However, the engine had decelerated to the point where RPM response to throttle was extremely slow. The student realized that his control inputs were having no effect and that he would be unable to regain flying speed before leaving the runway. He ejected at about 100 knots as the nosewheel left the runway.

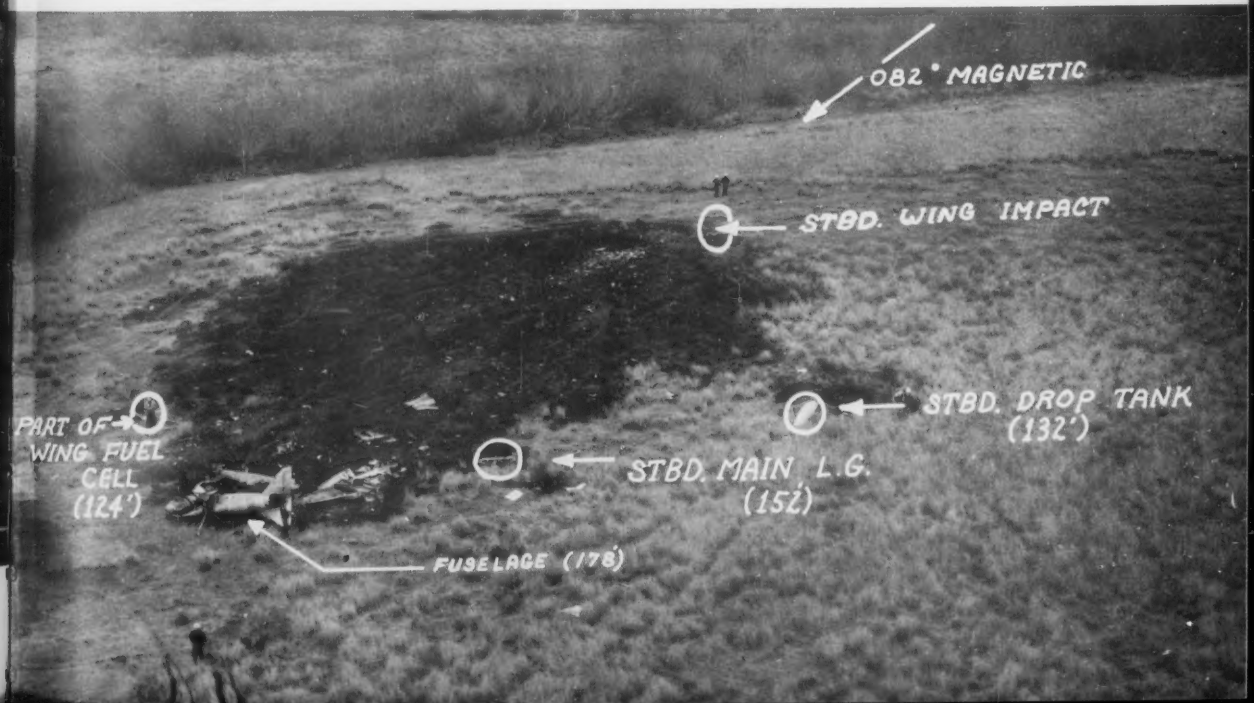
The ejection sequence was normal. The student landed on runway 35 left and was dragged about 50 feet across the runway before releasing his parachute. He stood, picked up his chute and seat pan, and walked clear of the runway. He suffered only minor injuries and was picked up by the crash crew.

After ejection, the pilotless aircraft continued across the infield between runways 35 left and 35 right (see photo), crossed runway 35 left and accelerated. It continued on a northwesterly heading and became airborne near the upwind end of the dual runways. After climbing to 300 feet, the aircraft commenced a wingover and crashed into a field ½-mile upwind.

The aircraft on final waved off. The pilot had seen the canopy separate from the distressed aircraft on the runway and maneuvered to avoid it. He subsequently made a routine landing.

The investigation revealed no evidence of material failure. The pilot stated that he was in the habit of checking the aircraft brakes immediately after touchdown regardless of airspeed and that he did so this time. These procedures are incorrect. He also stated that he kept his feet on the rudder pedals from the time he checked his brakes until he ejected. Investigators concluded that the pilot landed the aircraft with his left foot on the brake pedal, restricting the roll of the port wheel and causing the tire to blow.

Granted, this pilot was a student and was relatively inexperienced. However, landing with "heels on the deck" and staying off the binders until the aircraft slows to a safe braking speed, are elementary procedures. We simply cannot afford to lose aircraft because pilots fail to observe basic precautions. ◄



Anymouse

Zip Lip and Safety

ON a recent COD flight to a CVA, we found the ship had a strict "Zip Lip" policy in effect on land/launch. No transmissions except emergencies, although they were not in a restrictive EMCON condition and were fairly open on other frequencies.

While still on marshal frequency we were told we would be the first to recover for a "quick spin." We heard them tell each of the jets as they checked in that the "Charlie One" would land first. We were put in a starboard Delta pattern at 500 feet. When the ship started launching aircraft we were told to monitor tower frequency and "Hawk the deck." This meant that we were to orbit close aboard the ship's starboard quarter and watch for the landing area to become clear of launching aircraft, then take our own "Charlie."

If any transmissions were made on land/launch such as reporting in, Delta, calling the ball, or reporting our gross weight and souls onboard, we could expect a chewing out on deck after landing. After a few turns in starboard Delta, we came by the starboard side of the ship and observed four jets still in the landing area – one on the waist cat and three others aft. A right turn was commenced abeam, and after about 315 degrees of turn, the mirror lights were seen to come on. The landing area appeared clear.

I quickly performed my landing checklist and started a right hand approach. I noticed a flight of F-4s approaching the break ahead of the ship and it looked like I'd have plenty of time to get aboard ahead of them. I saw no other aircraft in the pattern and marshal had indicated that the F-4s would land after us.

About ½-mile from the ship, on final, paddles made the following transmission, "A-7 keep it coming." Right away I figured he wasn't talking to me. I immediately looked out the right side window and there was an A-7 on final about 10-15 feet from my wingtip. My first indication of his presence was paddles calling for him to keep it coming.

Needless to say, I waved off and waited until the rest of the launch was aboard and for the ship to break their precious "Zip Lip" to invite me aboard. As I read this narrative over, I keep asking myself how I let myself and eight other trusting souls get suckered into a near midair. Incidentally, I have over 5000 hours and 18 years flying experience, mostly in S-2/C-1 aircraft, and surely should have known better. I wonder what the ship's excuse is?

Codmouse

Zip lip operations for the Air Wing is one thing – for infrequent visitors, quite another. It's obvious that any comm procedure (or lack of) which might contribute to such a situation is inadequate and unsat. Those responsible are apparently

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT,
PREVENT AN ACCIDENT

blissfully unaware of the possible tragic consequences.

Clearance for Trouble

WHILE taxiing to the duty runway, my wingman and I heard a single-seat jet aircraft receiving clearance for a local instrument slide. He was cleared to the IAF for a TACAN approach with a missed approach to the GCA box pattern.

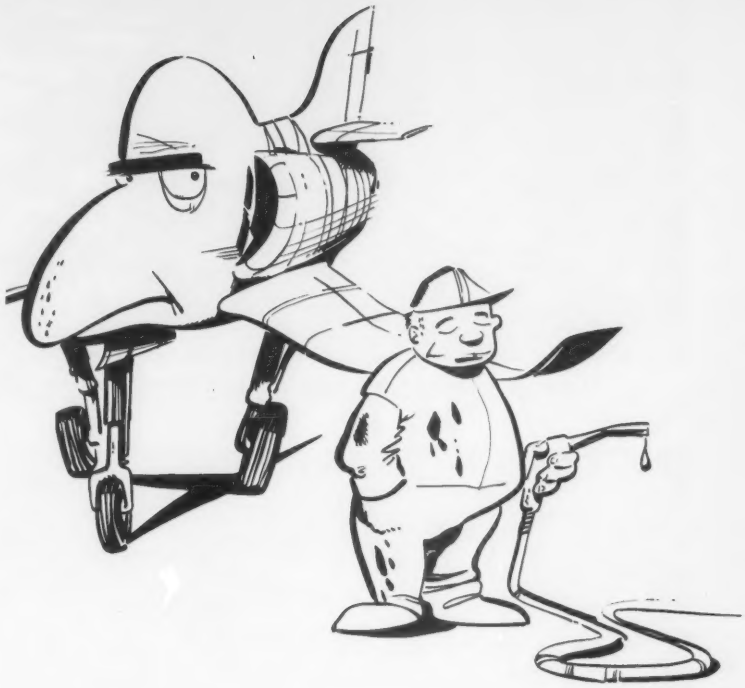
After receiving clearance, he replied, "Roger, but be advised that my AJB-3A gyro will probably fail after takeoff."

The weather was 1000 broken, 1500 over, and 3 miles in light rain. The GCA pattern was saturated.

I think this was a pilot requesting clearance for an accident, or at least an emergency. He should have filed an Anymouse report before he left.

Incredulousmouse

Guess he lucked out – this time. We haven't received a mishap report on him, yet. However, the odds are that we will if he continues to practice such dubious airmanship.



Transient Gripe

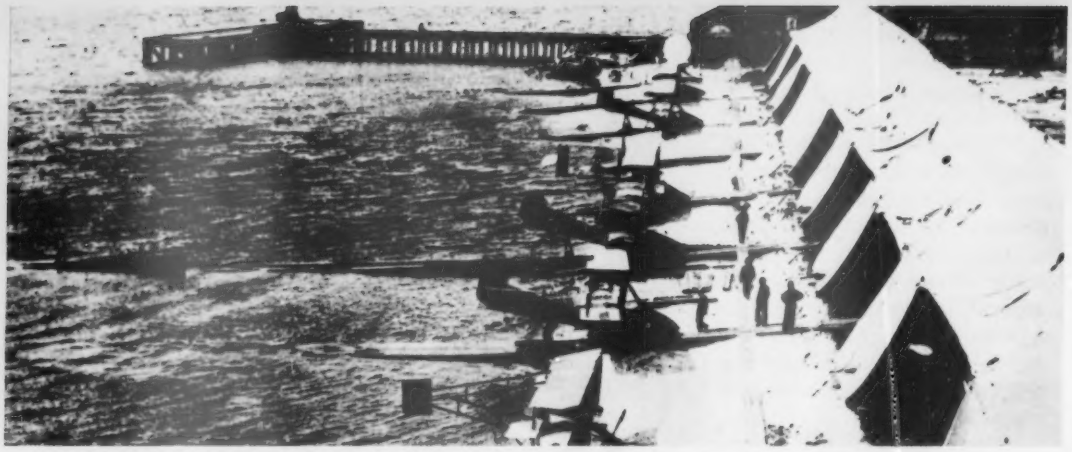
AS I stand here in NAS Blank operations waiting to be refueled, I have ample time to reflect on the quality of Navy transient service. Today at good old NAS Blank, someone decided that no plane could take on fuel unless it was connected to one of their new grounding points. The others, after 20 or 30 years, had been declared unsafe. Maybe so – I'm no expert on ground points. Anyway, after towing the two planes ahead of me up to the grounding post and fueling them, the truck ran out of fuel . . . .

. . . . Okay! If you didn't have a sense of humor, you shouldn't have joined up, right? Then, just as they tow my trusty attack type into position, someone questions the qualifications of the brake rider. That's proper, I guess. I probably should have ridden the brakes. Then as I sit in the line shack with a smile on my face (I wasn't in a hurry) chatting with the line crew, one of the crew mentions these problems as a good reason to stop elsewhere for service. Someone else agrees and suggests "passing the word."

That's when I lost my sense of humor. It suddenly struck me that the main difference between Navy and AFB transient service is not the additional Air Force personnel, not the additional equipment, not the extra bucks the Air Force gets, it's the ATTITUDE!! Where have the "can-do" hustlers gone? Where did the lackadaisical, sleepy, "Someone else will do it" types come from? I think this kind of attitude can jeopardize safety.

Transientmouse

According to CNO (Z-gram No. 10), personal services and support provided by naval air stations to crews of transient aircraft directly affect flight safety, morale, and efficiency in the Navy. Therefore, it is distressing to hear of a station where services or attitudes are poor. Let's hope this is an isolated case. Moreover, let's hope the situation at NAS Blank is corrected. Pilots can help correct unsatisfactory service by letting the Operations Officer concerned know about the situation. ◄



1914 view of Pensacola showing flying boats, hydroaeroplanes and tent hangars at the first permanent station.

The Pioneer Years

Part Two, 1914-1916

1914

January

20 The aviation unit from Annapolis arrived at Pensacola to set up the first permanent aeronautic station. This unit consisted of 9 officers, 23 men, 7 aircraft, and portable hangars. Lieutenant J. H. Towers was officer in charge. Lieutenant Commander H. C. Mustin (Naval Aviator No. 11), in command of the station ship USS MISSISSIPPI, was also in command of the aeronautic station.

April

20 First call to action – In less than 24 hours after receiving orders, an aviation detachment of three aircraft, three pilots, and 12 men, led by LT Towers, departed Pensacola onboard the USS BIRMINGHAM

Godfrey de C. Chevalier, Aviator No. 7

H. C. Mustin, Naval Aviator No. 11

W. McIlvain, USMC, Aviator No. 12

to join Atlantic Fleet forces operating off Tampico in the Mexican crisis.

21 A second aviation detachment from Pensacola, led by LTJG P. N. L. Bellinger (Naval Aviator No. 8), departed for Veracruz aboard USS MISSISSIPPI to also assist in the Mexican crisis.

May

6 The Curtiss AH-3 piloted by LTJG Bellinger with LTJG R. C. Saufley (Naval Aviator No. 14) as observer was hit by rifle fire while on a reconnaissance flight over enemy positions in the vicinity of Veracruz – the first marks of combat on a Navy plane.

July

1 Aviation was formally recognized with the establishment of an Office of Naval Aeronautics in the Division of Operations under the Secretary of the Navy.

28 Lieutenant (J.G.) V. D. Herbster (Naval Aviator No. 4) and LT B. L. Smith, USMC (Naval Aviator No. 6) conducted bombing tests at Indian Head Proving Grounds, Md. Dummy and live bombs were dropped over the side of the aircraft on land and water targets from an altitude of 1000 feet. Herbster reported his bombing would have been more accurate "if I had been able to disengage my fingers from the wind-wheel sooner."

August

21 Lieutenant Commander H. C. Mustin, LT P. N. L. Bellinger and 1/LT B. L. Smith, USMC arrived in Paris for a tour of aircraft factories and aerodromes. This temporary duty led to the assignment of aviation assistants to naval attaches, which began the

Aviation detachment at Veracruz, 1914. LTJG Bellinger (right) stands before first aircraft hit by hostile gunfire.

C. K. Bronson, Naval Aviator No. 15

Ken Whiting, Naval Aviator No. 16

Naval Constructor H. C. Richardson

After returning from Veracruz, LT Bellinger, pilot; and Machinist Adams at work on an AH-3.

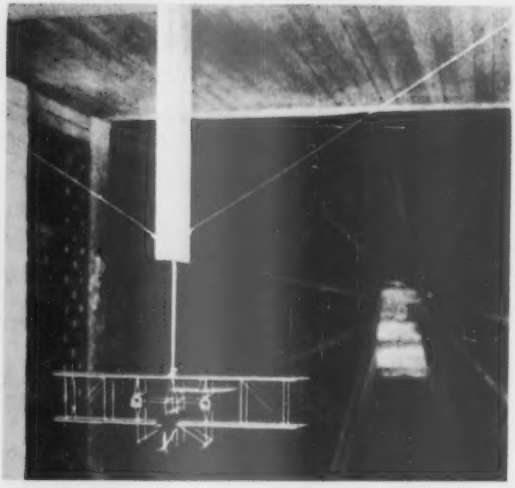
Pilot E. F. Johnson and pioneer naval air photographer W. L. Richardson.

same month LT Towers was sent to London. In September LTJG Herbster and LT Smith reported to Berlin and Paris respectively.

November

16 Pensacola became an independent command and was officially designated Naval Aeronautic Station, Pensacola.

25 The Director of Naval Aeronautics, CAPT M. L.



Model of 82-A, first aircraft designed and built by the Navy, under test in Washington Navy Yard wind tunnel.

Ensign Wadleigh Capehart holds early sample bomb device while straddling cockpit of a Burgess-Dunne.

LCDR P. N. L. Bellinger, USN

Bristol established requirements for special meterological equipment to be installed at Pensacola.

1915

March

3 The Naval Appropriations Act 1916, added enlisted men and student aviators to those eligible for increased pay and allowances while on duty involving flying.

22 The title "Naval Aviator" replaced the former "Navy Air Pilot" designation for officers qualified as aviators.

June

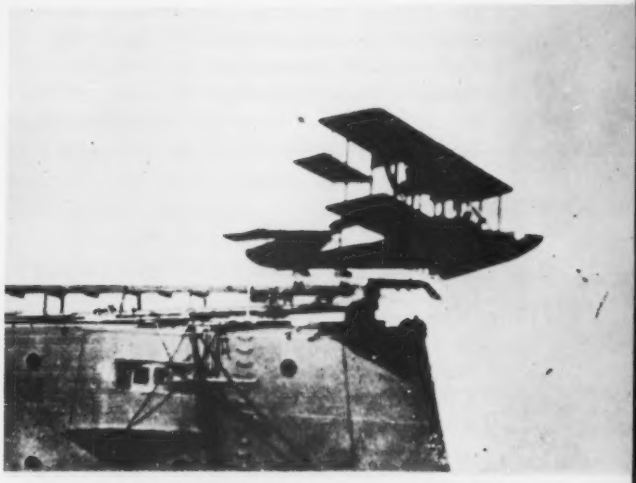
1 The Navy let its first contract for lighter-than-air craft to the Connecticut Aircraft Co., New Haven. It ordered one non-rigid airship which was later designated the DN-1.

July

22 Based on recommendations received from the Naval Aeronautic Station, Pensacola, the Director of Naval Aeronautics established requirements for 13 instruments to be installed in service aircraft: airspeed meter, incidence indicator, tachometer, skidding and slideslip indicator, altitude barometer, oil gage, fuel gage, compass, course and distance indicator, magazine camera, binoculars, clock, and sextant.

Continued

Swept-wing Burgess-Dunne, AH-7, flying over Pensacola.



With LCDR H. C. Mustin at the controls, the AB-2 flying boat is catapulted from the deck of the USS NORTH CAROLINA, November 5, 1915.

An experimental Gallaudet aeroplane with the propeller in the fuselage.

November

5 Lieutenant Commander H. C. Mustin, in the AB-2 flying boat, made the first catapult launching from a ship, flying off the stern of the USS NORTH CAROLINA in Pensacola Bay.

December

3 Lieutenant R. C. Saufley, flying the Curtiss AH-14, set an American altitude record for hydroaeroplanes, reaching 11,957 feet over Pensacola. He surpassed his own record of 11,056 feet set only 3 days before.

1916

January

6 Instruction commenced for the first group of enlisted men to receive flight training at Pensacola.

21 The Officer in Charge of Naval Aeronautics requested the Superintendent, Radio Service, to authorize radio operators at the Pensacola Radio Station to experiment with aircraft radio. This led to the establishment of an aviation radio laboratory at Pensacola.

March

30 In accordance with an agreement between the Secretary of the Treasury and the Secretary of the Navy, two Coast Guard officers were assigned to flight training at Pensacola.

May

20 Sperry Gyroscope Co. was awarded a contract for $750 to develop a gyroscopically operated bomb dropping sight.

June

9 Lieutenant Saufley, on an endurance flight in the AH-9 over Santa Rosa Island off Pensacola, crashed to his death after being in the air 8 hours and 51 minutes.

July

18 Flight clothing allowances were established by the Secretary. Aviators were to be furnished helmets, goggles, and safety jackets. Enlisted men whose duties involved flying were to receive, in addition, wool head cover, suit, gauntlets, and boots.

August

8 The Bureau of Construction and Repair became a lead bureau for aircraft development and procurement.

29 The Naval Appropriations Act for fiscal year 1917 provided for a Naval Flying Corps composed of 150 officers and 350 enlisted men. It also provided for a Naval Reserve Force of six classes including a Naval Reserve Flying Corps.

November

8 Lieutenant C. K. Bronson (Naval Aviator No. 15) and LT Luther Welsh, on an experimental bomb test flight at Naval Proving Grounds, Indian Head, Md., were fatally injured by the premature explosion of a bomb in their plane.

We've come a long way in the past 61 years. From the first naval aircraft constructed of bamboo, spruce, wire and fabric, to supersonic jets, nuclear aircraft carriers, and space vehicles. It started with those daring young men in their flying machines. Names like Ely, Ellyson, Rodgers, Towers, Cunningham, Chevalier, Bellinger, Mustin, Saufley, and Whiting should never be forgotten.

(In future issues of APPROACH we'll cover WW I, the "Roaring Twenties," the "Thirties," WW II, Korean War, and Vietnam War. In addition, we'll present an article detailing the first aircraft accident reports on file at the Naval Safety Center. – Ed.) ◄

Saturday morning plane inspection, NAS Pensacola, June 27, 1917. Note S-4 trainers in foreground.

Howgozit for Standardization?

By CAPT R. D. Verbael, USMC

THIS is an excellent opportunity to sit back and evaluate *your* squadron by asking the following questions:

(1) Do my squadron mates and I "talk up" flying?

(2) Do we review what has been published in NATOPS pubs?

(3) Do we debrief incidents, close-calls, etc, at AOMS?

(4) Do our PUI's know what to expect on instructional hops?

(5) Do I feel comfortable flying with squadron mates?

(6) Can I get the "straight word" from instructor pilots?

(7) Do my squadron mates and I strive for professionalism?

If the answer to any of these questions is "no," it is time for a unit-wide evaluation of the NATOPS program. Consider the value of a rigid stan program when examined in terms of the following areas:

• *Habit Patterns:* Habit patterns, good or bad, are established by repeating a maneuver or procedure a number of times. When we are faced with an emergency or condition of flight that requires prompt, positive action, habit patterns gained from review of NATOPS can often spell the difference between tragedy and "another sea story."

• *Emergency Procedures:* NATOPS publications are under constant review and are updated as necessary. Therefore, it is reasonable to conclude that procedures published are the latest and best known. Deviation from this wealth of guidance and information is foolhardy when viewed from this aspect.

• *Flight Operations:* The need for each pilot in a particular flight, whether a training or an operational flight, to have the *same* word is essential for effective mission performance and safety of flight. The confidence an aviator has in himself, his aircraft, and other aviators in his flight will skyrocket when everyone can predict "what's happening." The NATOPS program provides the basis for this type of confidence.

• *Training:* A non-standardized atmosphere can be extremely frustrating to the student and instructor alike. With the interaction of several instructors all putting out different word, who is the student supposed to believe? Pity the exasperated instructor trying to sort through bits of gouge students pick up, some in direct conflict with published NATOPS procedures. An effective stan program consisting not only of the written word but "talking it up" at APM's, bull sessions, and even at Happy Hour, is guaranteed to eliminate this unhappy situation.

Standardization means simply, getting all participants to do the same thing, to use the same procedures, to play by the same rules, and to adhere to the same doctrine. NATOPS provides a timely, viable instrument for accomplishing this continuing task.

Courtesy MAG-26 *Safety Review*

Doorgunners Do The Damndest Things

THE BIG hand was on 12 and the little one on six when we completed the last sortie to the field site. It had been strictly pigs and rice all day and we were tired. Now in the late afternoon as we were grinding along, shuffling home at 1500 feet, I leaned back in the seat of the UH-1, and snaking out a cigarette, felt for and found a packet of matches. It was empty.

"Anybody got a light?" I intoned on the mike. There was no reply. I glanced at the copilot and found myself mildly irritated, remembering he didn't smoke. A few moments went by, while in the back of my mind's eye, I envisioned the doorgunner and crewchief searching themselves for some hidden fire-making tool. Then I heard a rapping on the window outside the cabin door.

Not wanting to look, I shot one quick glance to the right and saw Jones' face leering at me through the Plexiglass. He was balanced on the skid and seemed to be enjoying his excursion as, holding onto whatever was there, he held up a battered cigarette lighter. Uncrossing my eyes, I eased onto the controls and banked sharply right. Grinning into Jones' astonished face, I saw him thrashing to grab on. Still holding the lighter, he disappeared in the wind. Looking back and down, I could see him spinning 15 feet below on his monkey strap. It wasn't long until he climbed back up and plugged in his helmet. A long silence followed while everyone waited, expecting him to say something. Finally, Jones spoke in a voice remarkably casual. What he said had nothing to do with his most recent experience and was addressed to the crewchief sitting on the other side. "You got a light? I lost mine." The crewchief replied, "Sorry about that." Meaning he didn't have a light either but appreciated the manner by which Jones had gone about losing his. And so we flew along in silence, each with his own thoughts, and I with my unlit cigarette.

We all heard the Mayday when it came, bringing that special tenseness to the stomach. It was another *Huey* going down not far from our position. That he was in serious trouble was evident by the voice which broke our thoughts.

We arrived in minutes and circled a gaping hole in the dense undergrowth from which a column of black smoke was beginning to boil. Hovering upwind over the trees looking for a way to land, we reported all we saw over the radio. It was a bad, bad area far from friendlies and long known to contain a hodgepodge of enemy units which hid their activities beneath the jungle roof. We knew that any survivors would have to be rescued quickly before the enemy reached the crash. But there was no place to land and darkness would soon make any attempt to secure the site an operation of great risk.

Then faintly we heard a survivor, obviously transmitting over one of those emergency portable radios, trying to contact us. His voice, though weak and garbled, sounded determined despite obvious pain. A few words and short phrases came through. "Hurt badly" and "Need help" were enough to touch our souls as we hovered over the trees in search for a way.

Again Jones' casual voice came over the intercom. "I've got a tiedown rope ready, and I'm ready," was all he said. Remembering we carried these on board, I glanced back and saw Jones out on the skid in full battle

dress, holding onto a long nylon rope, one end of which he had fastened to a tiedown ring on the cargo floor. Knowing the other end couldn't possibly reach the ground, Jones had already started down. Straining, we maneuvered him into the top of a tall tree. He disappeared.

A few moments later we could see him near the still smoldering wreckage as he went into some thick bushes. He reappeared carrying someone in his arms, then went back for others. In seconds he had located the entire crew and now waved his arms to us. By this time, the crewchief had pulled in the long tiedown, and joining it to another from his own container, guided us directly over and down into the hole until our rotor blades were cutting branches.

Lowering the rope, we saw that it just reached Jones' outstretched arms. Jones managed, by a series of loops, to strap the men together. Now he hooked them on and signaled. Upward we hovered, the aircraft trying to run out of control and do a combination of other unusual things because of so much weight on that single strand. Getting the bundle clear of the branches, we hovered off over the trees. About a mile away we came to a big enough clearing where we carefully deposited the men and landed to get them all inside. Although injured, none were too badly hurt. We went right back after Jones.

By now it was dark, and although we looked until our fuel got low, we couldn't find the spot. The next day when we went back in force, the area was too hot to get into. On a high-speed low-level recon, one of the AH-1G *Cobra* pilots said it was like being inside a popcorn popper. That much enemy fire was more than we wanted to take, and besides, by now everybody figured that Jones was probably a goner. There wasn't much point in risking any more lives with the odds so much in the enemy's favor.

We listed Jones as missing in action on the morning report and put him in for an award, citing his "constant fortitude" and "perseverance in the face of danger." I doubt if Jones knew what any of those words meant, but it was a way of making us all feel better.

One morning about 2 weeks later I was sitting in my office when I heard the first sergeant roar slightly off key, "Where in the HELL have you been?" Looking out, I saw two MPs, and in front of them stood Jones. In a casual voice he began to explain how he'd returned about 3 days ago and figured he'd better spend a couple of days in town. No, he didn't know the town was off limits . . . no, he didn't know he was missing in action . . .

When the adjutant called, we canceled Jones' award. Later that day he was back flying.

Courtesy *U.S. Army Aviation Digest*

Requisite for a Heavyweight

By LCDR D. A. Mohr

THERE is nothing which sends the average helicopter pilot scurrying for his NATOPS manual faster than a requirement to operate at max gross. For buried within the HIGE and HOGE (Hover In/Hover Out of Ground Effect) charts is the real meat of a helicopter heavy lift capability. The charts contain all the factors influencing lift – temperature, pressure altitude, and wind. From these charts a maximum recommended gross operating weight is determined.

Once arriving at the magic figure for a given set of conditions, can we be absolutely certain of lifting that *several thousand pound what's-it?* Not without some qualifications we can't.

Difficulties in helo operations under max gross weight conditions have existed since the very first helicopter staggered into the air. In fact, considering their skinny payload, the pilots of early types probably operated more at the extreme end of the flight envelope than

most pilots today. Those pilots were accustomed to operating with little or no excess power available and were conscientious in precise RPM control.

A comfortable power reserve exists in many modern helicopters, giving pilots little opportunity to routinely employ subtle techniques necessary to accomplish the more exacting heavy lifts. Unfortunately, with this reserve power, too many pilots are lulled into a false sense of security somewhat akin to the euphoria of – "why practice autorotations in a multiengine helicopter?" Yet, the very same engines that have given this comfortable margin of reserve power and increased single-engine capabilities have been used to lift heavier payloads under varying ambient temperatures – yes, even increasing the helo's lifting capability. In this light perhaps that power reserve really isn't so awe inspiring after all!

Latching onto an external load is one of the quickest ways to change your normally responsive aircraft into something similar to an overloaded dump truck. Pilots lifting external loads feel pretty confident. They know that in an emergency the load can be jettisoned. Further, when payload weight is questionable, they *can* give it a try. After all, if the helo can't hack it, the load can always be set back down. Right? Maybe, maybe not.

Before you go for broke and try to heft that load, what gages are you going to use to determine just how much power to commit in lifting it? Are you sure your engines are developing full (topping) power? Was this verified by a H219 Engine Trim Checker? If so, this will eliminate any T_5 or N_g instrument error you might be compensating for. If your rotor blades are dirty or compressor blades are erroded, you may be surprised to find you can't pick up the advertised weight. Should you choose to use your torque meter as an accept/reject

yardstick, were the torque values you noted on topping reasonable, and has this system been calibrated lately?

Once a strain is taken on the load, just how much engine power should be committed to breaking the load off the deck? Old and not so bold H-34 pilots used to commit only 53 of the 56 available inches of MAP at 2800 rpm to lifting a load. They recognized the requirement for additional power to transition into forward flight. Today one still hears bum dopesters contend, and unfortunately teach others, "If you can hover with a load, you can take off without additional power." They argue it's safe to commit full power and reduce (droop) rotor speed slightly to effect a heavy lift. No way! They simply and ignorantly fail to profit from the numerous testimonies (AARs) of pilots before them who believed exactly the same thing.

The Army Go, No-Go placard debunks this misconception completely. They recognized the need to monitor a *single* performance instrument when attempting a heavy lift and chose the gas producer tachometer (N_g). The placard compensates for increases in temperature – above standard day. Briefly, it alerts pilots to hold some engine power (N_g) in reserve just the way those H-34 pilots used to do. Engine performance can be determined through N_g or torque meter reading. However, torque is affected by both temperature and pressure altitude requiring a handbook for interpolation while N_g is affected only by temperature. Therefore, N_g is preferred.

One shortcoming in most helicopter lifts is the problem of correct payload determination. Often when the sum of unknown or incorrect weights reaches excessive proportions, a warning in the form of loss of RPM is too late. Experienced operators heed this and reduce their payloads.

Unfortunately, pilots of cargo-carrying helos can only estimate the weight of their load, and appearance often has little relation to the actual weight. Another overlooked source of additional weight is all that extra support and survival equipment stored in the cabin, such as cruise boxes full of miscellaneous gear, tools, grease, and oils.

Helicopter basic weights have long been heralded as one of the essential elements in the determination of gross weights. Consider now a paradox. It has been proven that the basic weight of production line models will vary only 225 pounds between the lightest and heaviest. Yet, errors in chart interpolation are usually larger than this. Many result directly from poor chart representation where the thickness of a pencil line represents hundreds of pounds. Other errors are due to unfamiliarity with the charts.

Now, think what happens when charts are reduced to kneeboard size and one tries to read them in "ole shaky." Impossible! A more realistic approach would be a 100-foot per minute rate-of-climb tabular presentation. This would offer an immediate solution to the problem, not another problem to the solution. Hover charts tell you that you can hover only under certain conditions; a table will tell you *if* you can fly. (See opposite page.)

Let's take guesswork and doubt out of heavy lifts and replace them with accuracy and confidence.

Wind Requirements for Vertical Takeoff at Sea Level

100 FPM vertical rate of climb, out of ground effect, with military power.

Outside Air Temperature °C	Headwind, Knots						
	0	5	10	15	20	25	30
14	9950	10000	10000	10000	10000	10000	10000
16	9750	9900	10000	10000	10000	10000	10000
18	9600	9700	9850	10000	10000	10000	10000
20	9450	9550	9700	10000	10000	10000	10000
22	9250	9400	9550	9850	10000	10000	10000
24	9100	9200	9400	9700	10000	10000	10000
26	8950	9050	9250	9550	10000	10000	10000
28	8800	8900	9050	9400	9900	10000	10000
30	8650	8700	8900	9250	9750	10000	10000
32	8450	8550	8750	9050	9550	10000	10000
34	8300	8400	8550	8900	9400	9950	10000
36	8100	8250	8400	8750	9200	9800	10000
38	7950	8050	8250	8600	9050	9600	10000
40	7800	7900	8050	8400	8900	9450	9900
42	7650	7750	7900	8250	8750	9300	9700
44	7500	7600	7750	8100	8600	9150	9550
46	7300	7400	7550	7900	8400	8950	9400

Basic Weight = 6487 lbs.

Aircraft basic weight includes auxiliary fuel tanks and ditching gear. The basic weight may vary from aircraft to aircraft. For exact weight refer to Chart C in the Handbook for Weight and Balance Data.

Operating Weight

Aircraft with 3 man crew (180 lbs. each) 7094 lbs.

Aircraft with 4 man crew (180 lbs. each) 7281 lbs.

The operating weight is for UH-2A configured for plane guard duty with the following survival and rescue gear: seat, sling, PK2 raft, one back pack per man, crewman gear and five Mae West units. The weight of survival and rescue gear is:

Mae West	5.5 lbs.
Back pack	7.5 lbs.
PK2 raft	19.0 lbs.
Rescue seat	10.0 lbs.
Rescue sling	4.0 lbs.
Crewman gear	3.0 lbs.
Parachute	24.0 lbs.

Maximum payload may be determined as follows:

Max Gross Wt. from Chart
Less Operating Wt.
Payload + Fuel

The crash site showing aircraft and pylon (above) and (right) the offending tree that caused it.

TAIL PYLON Departing

"CHARLIE, show me a spiral approach into the LZ down there." Charlie demonstrated as requested and ended up with a busted bird.

The landing zone was a relatively clear, rectangular area 500 by 165 feet. Smack dab in the middle were two trees, side by side.

He could have landed safely short, left or right of the trees. He even could have landed *over* the trees. But no, he zapped one with his tail rotor.

He was made aware of the trees on short final and acknowledged the copilot's announcement of the trees and their relative position. Charlie lost sight of them as he passed over, but continued the approach waiting for "tail clear" from the crew chief. Even though he was not certain of his position relative to the trees, he elected to continue the approach to a landing.

He landed all right – about 150 degrees off intended

touchdown heading – tailless. Fortunately the aircraft remained upright. All aboard escaped unharmed except the first mech who received minor injury because he wasn't strapped in.

Let's hasten to explain that the crew was on a training flight in the continental U.S., the scheduled syllabus flight had been completed, and the spiral approach was an authorized maneuver.

The mishap board, Charlie's CO, and various endorsers of the AAR took him to task more for errors of omission than commission. For example, he erred in judgment by not executing a waveoff. He continued to descend after passing over the trees – without assurance that he was clear. He also failed to comply with squadron SOP by beginning the maneuver from 1500 feet vice 3000 feet, without any briefing, and without making a clearing pass.

There are two fine points about approaches and landings in confined areas to be considered. First, the approach is a precision maneuver, and if you're not on the pipper all the way, prudence should dictate a waveoff. Second, it is assumed the area into which the landing is being attempted has been surveyed and is OK – no *hidden* dangers.

Helo pilots in Vietnam frequently are called upon to land in confined areas that others are supposed to clear for them. They frequently have to get in and out quickly because some "unfriendlies" are firing at them. Vietnam is a completely different ball game.

In a training environment, when there's no emergency or any other reason to land first and ask questions later, it's awfully hard to convince a mishap board that you were a victim of circumstance when you bent the bird. ◄

Yeah, I Understand

WHY'D you do that?

Two pilots in a T-2 departed a satellite airport for Homeplate. During the briefing before takeoff, the instructor had cautioned his companion, "If you have a simulated dual-engine flameout do NOT retard the throttles to off."

After clearing the pattern and while climbing to altitude, the instructor announced a simulated dual-engine flameout. The pilot under instruction said he would attempt an abbreviated air start and "sure enough" he secured the port engine!

The instructor took charge, allowed the engine to cool for 2 minutes, and then performed a normal air start. After landing, the instructor asked the question and received a classic reply –

I dunno.

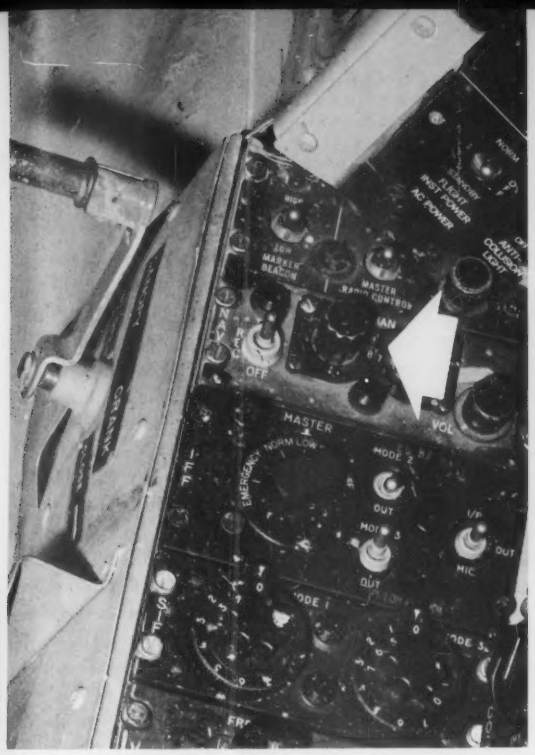
Sorry, Wrong Number

TWO pilots took off one morning in a T-1A on a scheduled proficiency training flight. The purpose was to administer an annual NATOPS/standardization check to one of the pilots. The PUI (pilot under instruction) occupied the front seat and the IP (instructor pilot) occupied the rear seat. Both were experienced aviators, but the IP was exceptionally well-qualified in that he had more than 7000 hours of flight time.

The flight plan called for a stop-over at another base, hot refueling, and return to homebase. Takeoff, arrival at the fuel stop, and departure went as planned. The return leg proceeded uneventfully – for a time. As the aircraft approached homefield at altitude, the Center handed it off to approach control.

Approach control cleared the aircraft to hold at the IAF (initial approach fix). After some delay in arriving at the IAF, the aircraft entered holding. A request was then made by the aircraft for an extension of the expected approach time to permit additional holding. This request was approved.

The aircraft was cleared for a TACAN approach with GCA pickup. The aircraft reported commencing approach, leaving FL 190, and passing 15,000 feet. This was the last transmission received from the aircraft despite many attempts by approach control on all available frequencies.



Arrows indicate channels that had been selected by the PUI and the IP. The IP had selected the correct TACAN channel, but did not have radio control in his cockpit.

The aircraft was located 3 days later. It had crashed on a mountainside at 1800 feet MSL. Weather in the area at the time of the crash was known to be 800 feet overcast with tops at 12,000 feet. There was evidence that the pilots had attempted ejection. However, the ejections were out of the safe ejection envelope and both pilots perished.

The position of the aircraft was approximately 25 miles south of where it would have been located had it, in fact, executed a proper TACAN approach to homefield. Investigators concluded that the aircraft had flown a TACAN approach with the *wrong TACAN channel selected.* That is, the PUI in the front cockpit had tuned in the wrong TACAN channel (he had radio control in the front cockpit). The channel selected was that of a station 25 miles south of homefield. This would account for the location of the aircraft at the time of the crash. The IP in the rear cockpit *did* have the correct TACAN channel selected. *However, this had no effect since he didn't have radio control in his cockpit.*

There are several points which merit discussion. First, the last digit of the station selected and the last digit of the correct station were identical. Thus, it's possible that the pilot in the front cockpit simply became confused by the similarity of the channels and inadvertently selected the wrong station. Even so, this error would have been detected if the pilots had taken time to listen to and identify the station ID signals.

Although simple confusion as to the station selected is a possibility, it seems more likely that trouble arose because of a lack of agreement/understanding between pilots concerning which cockpit had radio control. We have already noted that the pilot in the rear cockpit had selected the correct channel, while the pilot in the front cockpit had tuned in the "wrong station." It is possible that this was intentional. They may have been switching radio control back and forth between cockpits in order to make use of more than one TACAN station. That is, the homefield DME may have been erratic (reported to be a frequent occurrence) and the pilots could have been taking bearings off the "wrong station" to fix position.

This points up a potential hazard which exists in any tandem seat aircraft where radio control can be switched back and forth. *Always* ensure that radios in both cockpits are tuned as desired and *always* know which cockpit has radio control.

The loss of an aircraft and two pilots is a tragically high price to pay for the error of selecting a wrong TACAN station. Use care in performing cockpit duties, and when in a dual-piloted aircraft, ensure that the pilot and copilot back up each other. Two heads are better than one, but only if they are mutually supporting. ◄

Trial Run

NO one in an S-2 accident was wearing a survival vest.

Crewmen told the investigating flight surgeon that they believed the vest would hinder their escape through the small overhead hatch – especially if the LPA-1 were attached to the vest. Squadron pilots said they believe a large man cannot get through the hatch or bail out while wearing this equipment *and* parachute.

The flight surgeon decided to check this out.

He selected two very large, heavy pilots. When wearing survival vests, LPA-1's, and NB-6 parachutes with attached seat pack liferafts, it took them 15 seconds to unhook their lap belts and shoulder straps and "bail out." With all their gear on, it took 25 to 30 seconds to get out through the overhead hatch. When they exited via the overhead hatch and left their parachutes behind, as they normally would do in a ditching or ground emergency, they were out in less than 6 seconds.

"I don't think the survival vest with the LPA-1 attached significantly hinders a pilot when making an emergency exit," the flight surgeon reports. "I recommend that the squadron flight surgeon and safety officer emphasize this point in future lectures and ensure that ditching/bailout drills are conducted. Pilots and aircrewmen should be encouraged to wear their survival vests at all times."

The flight surgeon's thinking here agrees with a stopwatch bailout drill conducted previously by Safety Center personal survival equipment people.

A Safety Center equipment analyst picked three men at random, with no flight experience or training, for a bailout drill from an S-2 parked on a ramp. The men were equipped with NB-6 parachutes and attached raft assembly. They were strapped into their seats with seatbelt and shoulder harness. The largest man, who is 6 feet 4 inches tall and weighs 280 pounds, was assigned to the pilot's seat.

From the time the bailout order was given to the time the last man cleared the aircraft through the fuselage hatch (the bailout hatch), only 15 seconds elapsed – the same time as the flight surgeon's test. None of the men had any problem getting out.

As a final word, the Safety Center has no documented evidence of crew difficulties exiting or bailing out of an S-2 while wearing survival vest, LPA-1, and NB-6 with attached raft assembly.

Automatic Lifevest Actuator

SMOOTH and efficient teamwork of many individuals aboard ship – primarily the teamwork of the plane guard helicopter crew – is credited with saving the life of a hospital corpsman blown off the flight deck.

The ship was conducting air ops when the corpsman was dispatched to answer a call for medical assistance in a squadron line shack.

After attending to a minor injury, he rapidly made his way back to the flight deck dressing station. He saw an A-6 turning toward the catapult and avoided its jet blast. However, he failed to see an A-7 turning at idle speed with its brakes on, parked on the elevator. He walked directly into the jet blast 8 to 10 feet from the tailpipe and was blown over the side.

The incident was observed from the bridge, and the plane guard helo was immediately dispatched to the rescue.

The rescue crewman jumped into the water, lifted the unconscious man's head above the surface, and inflated his flight deck lifevest. He quickly signaled for the horse collar.

Both men were hoisted simultaneously. The helo crewman instituted resuscitative measures on the way to the carrier. There the corpsman was transferred to sickbay where he was treated for respiratory arrest, shock, aspiration pneumonia, and a cervical fracture.

Although this was the injured man's first experience as a flight deck corpsman, lack of training was ruled out by investigators as the cause of the accident. Prior to his assignment, he had been thoroughly trained.

Training had included lectures and response to simulated and actual casualties above and below decks. He had observed flight operations from the 07 level every day for 3 weeks. The senior flight deck corpsman had indoctrinated him in two actual launches and recoveries. He had been checked out on wearing flight deck shoes, clothing, helmet, and lifevest.

The day of the accident, he had been the flight deck corpsman on deck for eight launches and recoveries. Fatigue was also ruled

notes from your flight surgeon

out as causative – he had slept 7 to 8 hours each night, had eaten regularly, and had no personal problems.

The investigating flight surgeon reviewed this occurrence thoughtfully.

"This incident came within a few seconds of being a fatality and again emphasizes the imminent dangers which exist on a carrier flight deck," he writes. "Our task on the ship is to be aware of these dangers and then to best train and inform those who work on the flight deck in an attempt to prevent these accidents.

"Volumes have been written evaluating flight deck factors and how best to communicate preventive measures to the crew, yet accidents continue. So often our investigations conclude with intangible causal factors such as fatigue, complacency, misjudgment, and inattentiveness. It is unfortunate that more concrete factors cannot be elucidated in our constant struggle to reduce the frequency of accidents.

"From analyzing this incident, I wonder if there are any improvements which could have prevented it," he continues. "But I'm afraid I am left with the inherent dangers of the flight deck where many powerful aircraft are roving around a small area amongst many unpredictable and temperamental human beings.

"There were no unusual adverse conditions present in this instance. The seas were calm. The sky was clear. The temperature was warm. The wind was not excessive. I had personally spoken to the corpsman on each of the 2 days prior to the accident, and he was in good health. He had been getting adequate sleep, eating regularly, and was under no duress. His training had been adequate prior to his assignment to the flight deck. He constantly showed above-average performance in all his duties and was considered one of the more competent corpsmen in the department.

"It is my opinion that no one could have predicted that he would walk into the jet blast or could have prevented him from doing so. The pilot was not aware of his presence or that an accident had occurred. The plane captain had handed the aircraft over to the director whose attention was focused forward toward the catapults. The tower, who had dispatched him to the site of the injured man initially, was busy observing the launch in progress.

"In the final analysis, it seems that he was a victim of his own misjudgment. A momentary fixation of his attention on one item while continuing to move quickly across the deck caused his entry into the jet blast."

The flight surgeon makes a recommendation "of a more specific nature." "It seems reasonable," he states, "that anyone who is blown into the water from a height of 60 to 70 feet will be stunned initially." He recommends that the flight deck lifevest be designed with either a chemical or a mechanical actuator which would inflate it on contact with sea water.

In this instance, the corpsman impacted the water face down, arms and legs outstretched. Until the rescue crewman reached him, he remained in this position without movement. Even if he had not been stunned, his injury would have prevented him from manually inflating his vest. An automatically-inflated lifevest would have raised his head above water.

The Naval Ship Research and Development Center in Annapolis is currently working on an automatic lifevest inflator – a water-activated CO_2 cartridge actuator for the modified Mk-1 lifevest.

The actuator is spring-loaded and has to be 18 inches under water before it works. This requirement keeps rain and moisture accumulation from activating it during routine wear or storage. The actuator is currently in the engineering phase. Fleet evaluation models will probably be ready in the early fall.

With the advent of such a water-activated actuator, men blown off the flight deck will have a better chance of survival. ◄

An old-timer remembers when 'Smoke Gets in Your Eyes' was a song, not a pollution report.

Wanted: Two Heads

ARRIVING at homeplate after a routine day training mission, a flight of two RA-5Cs was cleared for individual TACAN penetrations with GCA pickups. Reported weather was 500 scattered, measured 2100 overcast, visibility 6 miles in haze.

The flight leader commenced his approach with just under 3800 lbs of fuel. Because of this, he elected to perform an idle penetration from 17,000 feet to 3000 feet. He entered the clouds at 3500 feet MSL and at 10 miles was cleared to 1400 feet. Configuration was gear down, flaps/droops at 30°/25° (with 50° flaps to go at glide slope interception).

Approaching 1400 feet MSL, he commenced level-off and airspeed bled off to 140 KIAS. Fuel state was 3000 lbs.

At this point in the approach the pilot set both throttles at about 85 percent (by feel) and engaged the APC. The amber APC light went out. Cycling the temperature switch produced a fuel flow fluctuation, but the throttle position did not change. Angle-of-attack

was stable at 13 units and airspeed was decreasing through 135 KIAS. It should have been obvious to the pilot that there was a discrepancy between the AOA and airspeed indicators. Further, with airspeed well below that required (143 knots) for the existing configuration and still decreasing, full military power or afterburner should have been selected to increase airspeed.

This was not done. Instead, the pilot disengaged the APC by closing the speed brake switch, advanced the throttles momentarily, then retarded them to 85-90 percent. The APC was reengaged. The angle-of-attack indicator read a steady 13 units, the index chevron was fast, and at no time was the rudder shaker felt. Airspeed now was near 130 KIAS.

Since APC engagement again produced no throttle movement, both throttles were rapidly advanced to full military. Neither pilot nor RAN felt an increase in thrust or a control response to full forward stick.

The aircraft broke out beneath the overcast nose down in a right 30-45 degree bank. The aircraft was passing through 1000 feet MSL (750 feet AGL).

Airframe buffeting was encountered. After issuing a warning to the RAN, the pilot initiated ejection. The crew was rescued with only minor injuries. The aircraft was destroyed.

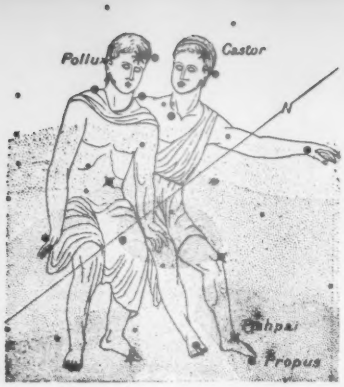
Investigators concluded that the pilot flew the aircraft into a condition below minimum control speed, and that the airspeed had deteriorated to a point where recovery could not have been accomplished in the remaining altitude. It was surmised that the pilot became engrossed in his attempts to engage the APC and allowed his scan to deteriorate to the point where he was unable to properly assess the discrepancy between the airspeed and angle-of-attack. The procedure used for engaging APC at a lower than optimum airspeed is contrary to NATOPS and put the aircraft on the backside of the power curve. This reduced the time available for corrective action and increased both rate of deceleration and thrust required for recovery. Flight under instrument conditions aggravated the situation.

The mishap board concluded that the AOA probe possibly jammed or was binding. A similar discrepancy had previously occurred, but not under instrument conditions nor with such drastic results.

An obvious lesson here is that pilots should fly the aircraft first and guard against fixating on peripheral matters, e.g., suspected APC problems. The mishap board recommended that all RA-5C crews be briefed on the necessity of adhering to current NATOPS procedures when engaging and checking the APC in the power approach configuration. Had the pilot done this, the accident could have been avoided.

Finally, the *Vigilante* crew should work as a team. The RAN should monitor approaches and warn the pilot if he believes an unsafe situation is developing. Granted, airspeed indicators in the rear cockpit of the RA-5C are not always accurate, but a procedure has been developed in the RA-5C RAG which overcomes this problem. The pilot gives the RAN a mark when he is on proper approach airspeed. The RAN then checks his TAS indicator and uses its readout as a guide. Then, if the TAS falls 5 knots below this speed, the RAN issues an appropriate warning. It may be a little awkward but it's worthwhile. Two heads are better than one.

(A mishap board should not have to recommend that flight crews adhere to prescribed NATOPS procedures. This should be SOP. If NATOPS procedures are questionable, discuss them with your NATOPS Officer and submit a change. If you don't know your NATOPS, get with it. Above all else, FLY the aircraft and scan, scan, scan. – Ed.) ◄



The Constellation Gemini.

Letters

It's amazing how much can be done
when no one cares who gets the credit.
Ace L.

Undershirt Under Nomex

FPO, San Francisco – We new guys (under 30) remember being told in flight school that it is necessary to wear an undershirt under the nomex flight suit to obtain all the protection this fine piece of gear was designed to give.

Unfortunately, some of the "old salts" who recall the good old days of orange zoom-bags refuse to wear T-shirts in hot weather. Because most of these people are senior to me, and because I can find nothing in writing requiring the wearing of these garments, I can't very well make them comply. Since the heavies don't dress properly, it's pretty hard to make my crew chief do it.

We, in the safety/NATOPS business, would much appreciate a statement on this matter.

ASO Mouse

● **The Aircrew Personal Protective Equipment Manual's statement in Chapter 4, page 4-1, says, "Cotton underwear should be worn under the coverall for optimum comfort."**

We queried NADC (Naval Air Development Center) which coordinates the testing and development for much of the Navy's protective clothing. NADC gave us the following word:

"We cannot provide a time in seconds of the fire protection afforded by the nomex coverall and cotton layering (T-shirt, etc.). However, all of our tests indicate that any 2-layer system is better than a single layer. When two garments are worn, an air layer builds up in between. Under intense fire nomex will act as a 'sacrificial layer.' As it gets brittle from the heat, it tends to pull away from the body, and you get benefit from the air layer and the second layer of clothing."

If the NADC conclusions don't impress your nonbelievers, there's another way to go. Local commanders have authority to set special clothing requirements in areas they consider potentially hazardous.

Safety Shoes

NAS North Island – Reading a letter titled "Ruba-Dub-Dub" (April APPROACH) concerning wearing of safety shoes by all personnel, I was finally prompted to pen my own views on the subject.

The letter described how wearing of safety shoes during installation of a bathtub in his own home had saved a man from injury and went on to ask why all hands couldn't get safety shoes. The gist of the letter and others I've read in recent times is that Navy safety gear should be used where needed – on or off duty. Other commentary I've seen in safety publications promotes the same theme, (even suggesting use of APH-6 helmets on motorcycles in one case).

That safety shoes are a great idea for *all* personnel is an obvious truism. That Navy-issued special purpose clothing or equipment should be worn during performance of nonofficial tasks is neither obvious nor true.

Safety shoes, OBAs, foul weather jackets, APH-6 helmets, and the like are purchased by the Navy at considerable cost to protect the user during some special hazard or exposure created by the nature of his military duty. Use of these items for personal convenience during off-duty hours represents an apparent illegal conversion of government property. If a person finds his after-hours' labors hazardous, he should buy himself appropriate safety shoes. If he operates a motorcycle, he should purchase a proper safety helmet rather than wear an APH-6. If a man is spray-painting his car, he should acquire a spray mask and not "borrow" an OBA; and if it turns cold, he can buy a warm jacket rather than filch a foul weather jacket.

The logic is, of course, that special purpose clothing is bought with government (taxpayer's) money. By what reasoning could an agency of the government (the Navy) provide leisure-time safety clothing for a select segment of taxpayers (naval personnel) without providing the same dole for all taxpayers?

I agree that all hands should be equipped with safety gear appropriate to the off-duty activities they may fancy. I do not agree that this should be done at government expense.

CDR J. W. Bradford Jr., USN
VRF-32

● **Perhaps we've gone from the sublime to the ridiculous in this conversion argument. The Center agrees with you 100 percent relative to the misuse of government property. However, can the wearing of issued safety shoes at home while lifting heavy objects or mowing the lawn be compared to "borrowing" an OBA for spray painting?**

What would a survey reveal where aviators were asked whether or not they wore steel toed flight boots outside the squadron area? It all boils down to the fact that control of such issued equipment falls under the all

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

encompassing umbrella of command responsibility.

Survival Gear Misuse

Location withheld – I'm a parachute rigger at an air station, and am appalled by the way pilots wear and treat their flight gear. The thing that gets me is that everybody is degrading our work and asking why so many URs are being submitted.

Let's take a look at the leadership which is setting the example for the command. A squadron CO at this station gave an order to modify his anti-G suit by installing a knife pouch. He knew this was illegal. We explained that the only modification permitted by NAVAIR 13-1-6.7 (Personal Protective Equipment Manual) was installing pockets on the lower portion of the leg. The knife pouch is a hazard to the pilot.

This CO also flies without an SV-2A survival vest. He carries his pen gun and flares in the pockets of his flight suit. Neither does he have 80 percent of his helmet covered with reflective tape.

This paraloft wrote these violations on the back of the crewman's history card which was shown to the AM inspector during a recent inspection. After reading this information, the inspector went up to take a look at the CO's gear. He found it as described. When our division officer went to get the CO's flight gear to correct the gripes, the CO told him to leave his flight gear alone – that it would stay the way it is.

This CO is leaving soon, but the damage from his poor leadership is already done.

This is only one instance pointing out the total disregard of existing publications. It also shows what poor backing the parachute riggers have.

I hope this letter will start some action to the good. But nothing will happen until we get the backing of our CO when we try to get everyone to comply with personal equipment regulations.

Name Withheld

● It is regrettable that a senior aviator would choose to disregard regulations and instructions for the wear and use of personal equipment. These instructions have been promulgated as a result of many years of research, testing, and development to satisfy operational requirements.

Disregard for NATOPS by a commanding officer is inexcusable considering the influence it exerts on his subordinates. This disregard for established procedures and regulations can undermine the overall objective of good order and discipline necessary for effective management of a unit. It is reasonable to assume that this same commander would not tolerate such disregard for instructions that he had personally issued.

It is unfortunate that as a dedicated parachute rigger you have had to live with such a situation. One recourse available to you is the education process, seeking assistance from local aviation safety officers, flight surgeons, and the NATOPS officer. These officers, armed with existing instructions can form the nucleus of an effective training program to educate all aircrews in the necessity to properly use personal flight and survival equipment. If these actions fail, the final solution can only be one of senior command influence.

The Naval Safety Center recognizes this problem and will continue to support proper use of personal equipment in compliance with NATOPS instructions. Continued attention will be directed toward this problem area in safety publications, correspondence, and safety surveys.

Boondoggle or Business?

MCAS (H) Santa Ana – It is indeed unfortunate that the article in the May '72 APPROACH, was credited to the 3rd MAW Safety Review when in fact the article was originally printed in the MHTG 30 Hover Check. You were on the distribution list for the Hover Check but apparently ignored the issue until it was reprinted in the Safety Review. Further, you ignored the credit to the author, MAJ D. M. Pirnie of HMHT 301, MHTG 30. I further cannot understand why the accompanying photo could not have been one of an aircraft with the word MARINES on the fuselage inasmuch as no such photograph appears anywhere in the issue even though there was ample opportunity to include one. There are several thousand Marine aviators in the air along with our Navy counterparts.

CAPT D. E. Cox
HMHT 301, MAG 16

● There are so many interested readers of *Hover Check* at NAVSAFECEN that by the time it reached the Safety Education Department we had already pulled the article from the *3rd MAW Safety Review*. Our apologies to MAJ Pirnie.

Our files of current Marine aircraft photographs are in short supply but we did manage to find one so as to afford some credit. Help us to help Marine Air; ask your PAO to send us photos of your birds.

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RADM W. S. Nelson
Commander, Naval Safety Center
Publisher

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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Credits

This month's cover features the "basic" hardware of the Naval Training Command, the T-34 *Mentor*. By using this cover for August, COMNAVSAFECEN recognizes the tremendous contribution made by all the VT types toward the "safest year" yet — FY-72. Pg. 16 Illustration by Don Lips.